CLAIMS

What is claimed is:

1. A method for tracking mobile objects along a target path, comprising:

   identifying a plurality of way-points along the target path;

   processing a position measurement of at least one object;

   computing a distance parameter between said position measurement and at least two of said way-points;

   defining a road segment between two of said way points closest to said position measurement; and

   linearly constraining said measurement position to said road segment and computing a regional measurement.

2. The method according to claim 1, further comprising determining a likelihood that said position measurement is within a range of said target path, and computing said position measurement without said linearly constraining if said position measurement is outside said range.

3. The method according to claim 2, wherein said range is a chi-square threshold.

4. The method according to claim 1, wherein said way-points are position coordinates are selected from at least one of the group consisting of: pre-determined geographical positions and dynamically derived geographical positions.

5. The method according to claim 1, wherein said position measurement is derived from triangulating a set of bearing lines from at least two sensors that detects said object.

6. The method according to claim 1, wherein said computing employs at least one uncertainty variable, said uncertainty variable selected from at least one of the group consisting of: a set of road way-point uncertainties and a measurement covariance.

7. The method according to claim 1, further comprising applying said regional measurement to a tracking filter.

8. The method according to claim 7, wherein said tracking filter is selected from at least one of the group consisting of: a variable gain filter and a constant gain filter.

9. The method according to claim 1, wherein said processing said position measurement is transmitted from a repeater.

10. An apparatus for tracking at least one mobile target, comprising:
   a communications section;
   a memory device; and
   a microprocessor coupled to said communications section and said memory device, wherein said microprocessor comprises a constrained measurement unit, and an estimator, wherein a target position measurement is linearly constrained by said constrained measurement unit prior to processing by said estimator.

11. The apparatus according to claim 10, wherein said microprocessor further comprises a fusion section that processes said target position measurement from a set of sensor measurements received by said communications section.

12. The apparatus according to claim 10, further comprising a global positioning system coupled to said microprocessor.

13. The apparatus according to claim 10, wherein said estimator employs a filter selected from at least one of the group consisting of: a variable gain filter and a constant gain filter.

14. A system for tracking at least one mobile target in a region along a target path having way-points, comprising:
   a plurality of sensors deployed in the region, wherein said sensors detect said mobile target;

5   a first processing section that receives target data from said sensors and processes

6   target localization information;

7   a second processing section wherein said target localization information is linearly

8   constrained and generates a regional measurement; and

9   a third processing section that filters said regional measurement and generates a

10   filtered target position.

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1   15. The system according to claim 14, wherein said target data from said sensors is at least

2   two bearing lines and said target localization information is processed using

3   triangulation from said bearing lines.

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1   16. The system according to claim 14, wherein said filtered target position updates a target

2   track.

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1   17. The system according to claim 14, wherein said third processing section employs a

2   tracking filter selected from at least one of the group consisting of: a variable gain

3   filter and a constant gain filter.

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1   18. The system according to claim 14, wherein said filtered target position is

2   communicated to a central processing center.

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1   19. The system according to claim 14, wherein said target path has a threshold bounds and

2   if said target localization information is outside said threshold bounds, said target

3   localization information is not linearly constrained and said target localization

4   information establishes a non-constrained target position.

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1   20. The system according to claim 14, wherein said first processing section receives target

2   data from at least one repeater unit that communicates with said sensors.

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